

WHAT IS CLAIMED IS:

1. A blue organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;

a first mixed region comprising the hole transporting material and a blue light emitting material on the hole transporting region;

a light emitting region comprising the blue light emitting material on the first mixed region;

a second mixed region comprising the blue light emitting material and an electron transporting material on the light emitting region; and

an electron transporting region comprising the electron transporting material on the second mixed region.

2. A blue organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;

a first mixed region comprising the hole transporting material and a host material on the hole transporting region;

a light emitting region comprising the host material to which a blue light emitting material is added, on the first mixed region;

a second mixed region comprising the host material and an electron transporting material on the light emitting region; and

an electron transporting region comprising the electron transporting material on the

second mixed region.

3. A white organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;

a first mixed region comprising the hole transporting material and a first light emitting material on the hole transporting region;

a region comprising the first light emitting material on the first mixed region;

a second mixed region comprising the first light emitting material and an electron transporting material on the light emitting region;

an electron transporting region comprising the electron transporting material on the second mixed region; and

a second light emitting material,

wherein the second light emitting material emits light with a longer wavelength than that of light emitted from the first light emitting material.

4. A white organic light emitting device according to claim 3, wherein the second light emitting material is included in a part of the region comprising the first light emitting material.

5. A white organic light emitting device according to claim 3, wherein the second light emitting material is included in one of the first mixed region and the second mixed region.

6. A white organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;
a first mixed region comprising the hole transporting material and a first light emitting material on the hole transporting region;
a region comprising the first light emitting material on the first mixed region;
a second mixed region comprising the first light emitting material and an electron transporting material on the light emitting region;
an electron transporting region comprising the electron transporting material on the second mixed region;
a second light emitting material; and
a third light emitting material,
wherein the second light emitting material emits light with a longer wavelength than that of light emitted from the first light emitting material, and
wherein the third light emitting material emits light with a longer wavelength than that of light emitted from the second light emitting material.

7. A white organic light emitting device according to claim 6, wherein the second light emitting material is included in the first mixed region whereas the third light emitting material is included in the second mixed region.

8. A white organic light emitting device according to claim 6, wherein the second light emitting material is included in the second mixed region whereas the third light emitting material is included in the first mixed region.

9. A blue organic light emitting device comprising an organic compound film interposed

between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;

a mixed region comprising the hole transporting material and an electron transporting material on the hole transporting region; and

an electron transporting region comprising the electron transporting material on the mixed region,

wherein one of the hole transporting material and the electron transporting material is a blue light emitting material.

10. A blue organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;

a mixed region comprising the hole transporting material and an electron transporting material on the hole transporting region; and

an electron transporting region comprising the electron transporting material on the mixed region,

wherein a blue light emitting material is added to the mixed region.

11. A white organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;

a mixed region comprising the hole transporting material and an electron transporting material on the hole transporting region;

an electron transporting region comprising the electron transporting material on the

mixed region; and

a dopant,

wherein one of the hole transporting material and the electron transporting material is a blue light emitting material, and

wherein the dopant emits light with a longer wavelength than that of light emitted from the blue light emitting material.

12. A white organic light emitting device according to claim 11, wherein the dopant is included in a part of the blue light emitting material.

13. A white organic light emitting device according to claim 11, wherein the dopant is included in the mixed region.

14. A white organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;

a mixed region comprising the hole transporting material and an electron transporting material on the hole transporting region;

an electron transporting region comprising the electron transporting material on the mixed region;

a first dopant; and

a second dopant,

wherein one of the hole transporting material and the electron transporting material is a blue light emitting material,

wherein the first dopant emits light with a longer wavelength than that of light emitted from the blue light emitting material, and

wherein the second dopant emits light with a longer wavelength than that of the first dopant.

15. A white organic light emitting device according to claim 14, wherein the first dopant is included in the hole transporting region and the second dopant is included in the electron transporting region.

16. A white organic light emitting device according to claim 14, wherein the first dopant is included in the electron transporting region and the second dopant is included in the hole transporting region.

17. A full color display device comprising:

a blue organic light emitting device according to claim 1; and

a member comprising a fluorescent material that is capable of absorbing blue light emitted from the blue organic light emitting device and emitting green light or red light.

18. A full color display device comprising:

a blue organic light emitting device according to claim 2; and

a member comprising a fluorescent material that is capable of absorbing blue light emitted from the blue organic light emitting device and emitting green light or red light.

19. A full color display device comprising:

a blue organic light emitting device according to claim 9; and

a member comprising a fluorescent material that is capable of absorbing blue light emitted from the blue organic light emitting device and emitting green light or red light.

20. A full color display device comprising:

a blue organic light emitting device according to claim 10; and

a member comprising a fluorescent material that is capable of absorbing blue light emitted from the blue organic light emitting device and emitting green light or red light.

21. A full color display device comprising:

a white organic light emitting device according to claims 3; and
a color filter.

22. A full color display device comprising:

a white organic light emitting device according to claims 6; and
a color filter.

23. A full color display device comprising:

a white organic light emitting device according to claims 11; and
a color filter.

24. A full color display device comprising:

a white organic light emitting device according to claims 14; and
a color filter.

25. An full color display device according to claim 17, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

26. An full color display device according to claim 18, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

27. An full color display device according to claim 19, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

28. An full color display device according to claim 20, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

29. An full color display device according to claim 21, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

30. An full color display device according to claim 22, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

31. An full color display device according to claim 23, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

32. An full color display device according to claim 24, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

33. A full color display device comprising a blue organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;

a first mixed region comprising the hole transporting material and a blue light emitting material on the hole transporting region;

a light emitting region comprising the blue light emitting material on the first mixed region;

a second mixed region comprising the blue light emitting material and an electron transporting material on the light emitting region;

an electron transporting region comprising the electron transporting material on the second mixed region; and

a member comprising a fluorescent material that is capable of absorbing blue light emitted from the blue organic light emitting device and emitting green light or red light.

34. A full color display device comprising a blue organic light emitting device

comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

- a hole transporting region comprising a hole transporting material on the anode;

- a first mixed region comprising the hole transporting material and a host material on the hole transporting region;

- a light emitting region comprising the host material to which a blue light emitting material is added, on the first mixed region;

- a second mixed region comprising the host material and an electron transporting material on the light emitting region;

- an electron transporting region comprising the electron transporting material on the second mixed region; and

- a member comprising a fluorescent material that is capable of absorbing blue light emitted from the blue organic light emitting device and emitting green light or red light.

35. A full color display device comprising a white organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

- a hole transporting region comprising a hole transporting material on the anode;

- a first mixed region comprising the hole transporting material and a first light emitting material on the hole transporting region;

- a region comprising the first light emitting material on the first mixed region;

- a second mixed region comprising the first light emitting material and an electron transporting material on the light emitting region;

- an electron transporting region comprising the electron transporting material on the

second mixed region;

a second light emitting material; and

a color filter,

wherein the second light emitting material emits light with a longer wavelength than that of light emitted from the first light emitting material.

36. A full color display device according to claim 35, wherein the second light emitting material is included in a part of the region comprising the first light emitting material.

37. A full color display device according to claim 35, wherein the second light emitting material is included in one of the first mixed region and the second mixed region.

38. A full color display device comprising a white organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;

a first mixed region comprising the hole transporting material and a first light emitting material on the hole transporting region;

a region comprising the first light emitting material on the first mixed region;

a second mixed region comprising the first light emitting material and an electron transporting material on the light emitting region;

an electron transporting region comprising the electron transporting material on the second mixed region;

a second light emitting material;

a third light emitting material;

a color filter,

wherein the second light emitting material emits light with a longer wavelength than that of light emitted from the first light emitting material, and

wherein the third light emitting material emits light with a longer wavelength than that of light emitted from the second light emitting material.

39. A full color display device according to claim 38, wherein the second light emitting material is included in the first mixed region whereas the third light emitting material is included in the second mixed region.

40. A full color display device according to claim 38, wherein the second light emitting material is included in the second mixed region whereas the third light emitting material is included in the first mixed region.

41. A full color display device comprising a blue organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;

a mixed region comprising the hole transporting material and an electron transporting material on the hole transporting region;

an electron transporting region comprising the electron transporting material on the mixed region; and

a member comprising a fluorescent material that is capable of absorbing blue light

emitted from the blue organic light emitting device and emitting green light or red light,

wherein one of the hole transporting material and the electron transporting material is a blue light emitting material.

42. A full color display device comprising a blue organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;

a mixed region comprising the hole transporting material and an electron transporting material on the hole transporting region;

an electron transporting region comprising the electron transporting material on the mixed region; and

a member comprising a fluorescent material that is capable of absorbing blue light emitted from the blue organic light emitting device and emitting green light or red light,

wherein a blue light emitting material is added to the mixed region.

43. A full color display device comprising a white organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;

a mixed region comprising the hole transporting material and an electron transporting material on the hole transporting region;

an electron transporting region comprising the electron transporting material on the mixed region;

a dopant;

a color filter,

wherein one of the hole transporting material and the electron transporting material is a blue light emitting material, and

wherein the dopant emits light with a longer wavelength than that of light emitted from the blue light emitting material.

44. A full color display device according to claim 43, wherein the dopant is included in a part of the blue light emitting material.

45. A full color display device according to claim 43, wherein the dopant is included in the mixed region.

46. A full color display device comprising a white organic light emitting device comprising an organic compound film interposed between an anode and a cathode, the organic compound film comprising:

a hole transporting region comprising a hole transporting material on the anode;

a mixed region comprising the hole transporting material and an electron transporting material on the hole transporting region;

an electron transporting region comprising the electron transporting material on the mixed region;

a first dopant;

a second dopant;

a color filter,

wherein one of the hole transporting material and the electron transporting material is a blue light emitting material,

wherein the first dopant emits light with a longer wavelength than that of light emitted from the blue light emitting material, and

wherein the second dopant emits light with a longer wavelength than that of the first dopant.

47. A full color display device according to claim 46, wherein the first dopant is included in the hole transporting region and the second dopant is included in the electron transporting region.

48. A full color display device according to claim 46, wherein the first dopant is included in the electron transporting region and the second dopant is included in the hole transporting region.

49. An full color display device according to claim 33, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

50. An full color display device according to claim 34, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

51. An full color display device according to claim 35, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal

computer, and a cellular phone.

52. An full color display device according to claim 38, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

53. An full color display device according to claim 41, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

54. An full color display device according to claim 42, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

55. An full color display device according to claim 43, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.

56. An full color display device according to claim 46, the full color device is included in one of the group consisting of a video camera, a digital camera, a portable computer, a personal computer, and a cellular phone.